

Appl. No. : 10/009,002
Filed : January 14, 2003

REMARKS

Applicant wishes to thank Examiner Lucas and Interference Specialist Helms for the courtesy extended to Nancy Vensko, attorney of record, on April 10, 2006. The Interview Summary Form PTOL-413 summarizes the discussion held at the personal interview. The present response to the outstanding Office Action includes the substance of the Examiner Interview.

A. Disposition of Claims

Claims 1-8 and 11-18 are pending in this application. Claims 9, 10, and 19-40 have been canceled without prejudice as being drawn to non-elected subject matter. The claims have been amended so that application of the two-way test leads to the determination that USP 6,627,437 to Traboni and the claims of the present application do not define the same patentable invention. Additionally, Claims 6-8 and 11-14 have been edited to add "isolated" to define patentable subject matter as opposed to products of nature and to avoid accidental anticipation by Simons et al., Proc Natl Acad Sci USA 92: 3401, 1995. Support for the amendment is found throughout the specification, for example, at Table 1 and page 27, last sentence ("last 259 nucleotides"), and at page 16, lines 20-23 ("isolated"). No new matter has been added. Reexamination and reconsideration of the application, as amended, are respectfully requested.

B. Compliance with Rules regarding Nucleotide and/or Amino Acid Sequence Disclosures in Patent Applications

The specification has been amended to add sequence identifiers, and a new sequence listing in paper and computer readable form (CRF) submitted to conform thereto. Table 1 has been substituted with a replacement Table 1 to correct two typographical errors. The first is at position 2566 (should be T C C not ~~T-T-T~~). The second is at position 9061 (should be 9061 not 9067). Support for the amendment is found throughout the specification, for example, at original Table 1. This is because Table 1 illustrates the points of difference among GBV-B, GBV-B, 2/94, and pGBB. Table 1 explains that the sequence of GBV-B is that of Simons et al. 1995, of record, which gives the GenBank accession no. as U22304; the sequence of GBV-B, 2/94 is that of an intermediate clone; and the sequence of pGBB is that of the infectious clone, which is SEQ ID NO: 1. Exhibit 1 is a sequence alignment of SEQ ID NO: 1 and GenBank accession no.

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U22304. Exhibit 1 illustrates that position 2566 is C in the infectious clone, pGBB, not T, as in Simons et al. 1995. Additionally, Exhibit 1 illustrates that the position in the 3'UTR at which the infectious clone, pGBB, differs from Simons et al. 1995 by having a C, not T, is at position 9061, not 9067. Finally, Table 1 explains that the sequence of the intermediate clone, GBV-B, 2/94, is identical to that of the infectious clone, pGBB, except at the positions marked by an asterisk, thus we can deduce that positions 2566 and 9061 are identical for these two clones. In sum, the correction of the typographical errors in Table 1 does not introduce new matter as illustrated by sequence alignment of the infectious clone, pGBB, and Simons et al. 1995. (Please be notified that SEQ ID NO: 3 is identical to SEQ ID NO: 1 except for missing the last 259 nucleotides to illustrate the critical point of difference between the prior art and the infectious clone.) Finally, the correction of the typographical errors conforms Table 1 of the specification to the post-filing date inventor-created art of Bukh et al., Virology 262: 470, 1999, of record, at Table 1.

C. Compliance with 35 USC 101

The issue is whether Claims 6-8 and 11-14 are in compliance with 35 USC 101. These claims have been edited to add "isolated" to define patentable subject matter as opposed to products of nature. The conclusion is that the claims are in compliance with 35 USC 101.

D. Compliance with 35 USC 112/1

The issue is whether Claims 1, 4, 6-9, 11-13, and 15-17 are in compliance with 35 USC 112/1 as meeting the written description requirement. The claims have been amended so that application of the two-way test leads to the determination that USP 6,627,437 to Traboni and the claims of the present application do not define the same patentable invention. Comparing NIH (the present Applicant) and Traboni, the claims of the present application are directed to a species falling within the genus of Traboni in which NIH's 3'UTR is encoded by the last 259 nucleotides of SEQ ID NO: 1. Otherwise, for both Traboni and the present application, the remainder of the full-length clone is defined with reference to a GB virus-B that is infectious. Traboni is presumed to be valid. The 259 nucleotide 3'-end is identified in the present application as being required for infectivity and as solving the problem in the prior art of the lack of an infectious clone. The conclusion is that the claims of the present application, which are directed to a species falling within the genus of Traboni are in compliance with 35 USC 112/1.

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E. Compliance with 35 USC 102(b)

The issue is whether Claims 8 and 11-13 are in compliance with 35 USC 102(b) or anticipated by Simons et al. 1995. The rule according to MPEP 2131 is that to anticipate a claim, the reference must teach every element of the claim. These claims have been edited to add “isolated” to avoid accidental anticipation by Simons et al. 1995. Simons et al. 1995 describes the non-infectious clone of the prior art missing the last 259 nucleotides. Simons et al. 1995 isolated the clone by converting nucleic acids extracted from preinoculation plasma or infectious plasma obtained from a GB-infected animal to double-stranded DNA by randomly primed RT and randomly primed second strand synthesis (Simon et al. 1995, p. 3402, col. 1, 1st ¶ of Results). The GB virus was not “isolated” just because it was found in plasma from a tamarin infected with the GB agent. The blood may have been *separated* to produce plasma. But the GB virus by itself was not *isolated*. Turning to the RNA, it was characterized and turned out to be missing the last 259 nucleotides. Ending with the host cell, it was not “isolated” either just because it was found in plasma from a tamarin infected with the GB agent. To reiterate, the blood may have been *separated* to produce plasma. But the host cell per se was not *isolated*. Please be informed that isolated RNA and host cells were patented in Traboni. Traboni is presumed to be valid. The conclusion is that Simons et al. 1995 fails to anticipate the claims, thus the claims are in compliance with 35 USC 102(b).

F. Separate Patentable Invention under 35 USC 102(g)

The issue is whether the claims define a separate patentable invention under 35 USC 102(g) or conflict with USP 6,627,437 to Traboni. The rule according to Eli Lilly & Co. v. Bd. of Regents of the Univ. of Wash., 67 USPQ2d 1161 (Fed. Cir. 2003) is that the two-way test is required for determining whether two parties claim the “same patentable invention”. A “separate patentable invention” means that the species invention of one party is new and nonobvious in view of the genus invention of the other party. Id. at p. 1164. The claims have been amended so that application of the two-way test leads to the determination that USP 6,627,437 to Traboni and the claims of the present application do not define the same patentable invention. The claims of the present application are directed to an isolated nucleic acid molecule which encodes GB virus-B having a complete 3’UTR and which is capable of producing infectious virus when transfected

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into cells in vivo, wherein the 3'UTR is encoded by the last 259 nucleotides of SEQ ID NO: 1. USP 6,627,437 to Traboni describes a genus in which the 3'UTR is encoded by SEQ ID NO: 1 (the last 309 nucleotides of the full length clone), or SEQ ID NO: 2 (the last 259 nucleotides of the full length clone), and variations thereof having no more than 10 alterations and provided that each of said alterations is a substitution, addition, or deletion. Comparing NIH (the present Applicant) and Traboni, the claims of the present application are directed to a species falling within the genus of Traboni in which NIH's 3'UTR is encoded by the last 259 nucleotides of SEQ ID NO: 1. Otherwise, for both Traboni and the present application, the remainder of the full-length clone is defined with reference to a GB virus-B that is infectious. Exhibit 2 is a sequence alignment of the last 259 nucleotides of NIH's SEQ ID NO: 1 and the last 259 nucleotides of Traboni's SEQ ID NO: 1. Exhibit 2 illustrates that there is one point of difference between NIH's and Traboni's sequences.¹ NIH's species is not rendered obvious by Traboni's genus considering the size of the genus. Given that Traboni's 3'UTR sequence is encoded by 259 nucleotides and variations thereof having no more than 10 alterations and provided that each of said alterations is a substitution, addition, or deletion, the number of possibilities embraced by the Traboni genus is almost infinite. The number of possibilities is estimated by the following formula

$$\sum_{n=1}^{10} \frac{3^n 259!}{n! (259-n)!}$$

that equals on the order of 2×10^{22} . Absent anything in the prior art suggesting which of the almost infinite possibilities embraced by Traboni corresponds to NIH's 3'UTR, the prior art would not have suggested the claimed species. Although a genus may be so small that, when considered in light of the totality of the circumstances, it would anticipate the claimed species, not so here. Remembering that it embraces a number of possibilities that is almost infinite, the Traboni genus cannot inherently anticipate the claimed NIH species because one skilled in the art

¹ Please be reminded that U.S. 2004/0039187 to Martin et al. is not prior art in that it claims priority back to the same priority date as the present application and, as illustrated in Exhibit 2, there is one point of difference between NIH's and Martin et al.'s sequences.

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would not envisage each member of the genus. Besides the size of the genus, a consideration of any teachings of a "typical" or "preferred" or "optimum" species within the disclosed genus reveals that any such teaching is nonexistent. Besides the size of the genus and lack of teachings to support the selection of the species, unexpected advantages reside in NIH's clone being fully infectious. Refer to specification at Example 3; accord, post-filing date inventor-created art of Bukh et al., Virology 262: 470, 1999, of record. Given the size of the genus, the lack of teachings to support the selection of the species, and the unexpected advantages, the conclusion is that the claims of the present application, which are directed to a species that is new and nonobvious in view of USP 6,627,437 to Traboni, define a separate patentable invention under 35 USC 102(g). No interference-in-fact exists.

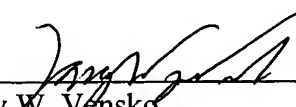
CONCLUSION

In view of the above, it is submitted that the claims are in condition for allowance. Reconsideration and withdrawal of all outstanding rejections are respectfully requested. Allowance of the claims at an early date is solicited. If any points remain that can be resolved by telephone, the Examiner is invited to contact the undersigned at the below-given telephone number.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 5/1/06

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Attorney of Record
Customer No. 45,311
(805) 547-5580

AMEND

2538523
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EXHIBIT 1



Blast 2 Sequences results

PubMed

Entrez

BLAST

OMIM

Taxonomy

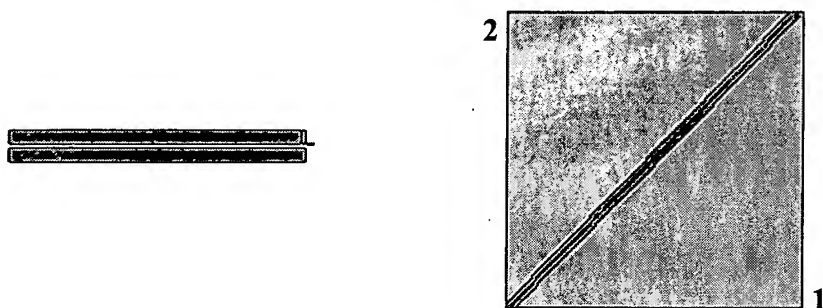
Structure

BLAST 2 SEQUENCES RESULTS VERSION BLASTN 2.2.13 [Nov-27-2005]

Match: 1 Mismatch: -2 gap open: 5 gap extension: 2
x_dropoff: 50 expect: 10.0000 wordsize: 11 Filter ☒ View option Standard
Masking character option X for protein, n for nucleotide Masking color option Black
☒ Show CDS translation

Sequence 1: lcl|seq_1
Length = 9399 (1 .. 9399)

Sequence 2: lcl|seq_2
Length = 9143 (1 .. 9143)



NOTE: Bitscore and expect value are calculated based on the size of the nr database.

NOTE: If protein translation is reversed, please repeat the search with reverse strand of the query sequence.



Score = 1.732e+04 bits (9009), Expect = 0.0
Identities = 9096/9137 (99%), Gaps = 4/9137 (0%)
Strand=Plus/Plus

| | | | |
|-------|-----|--|-----|
| Query | 1 | ACCACAAACACTCCAGTTTGTACACTCCGCTAGGAATGCTCCTGGAGCACCCCCCTAG | 60 |
| | | | |
| Sbjct | 1 | ACCACAAACACTCCAGTTTGTACACTCCGCTAGGAATGCTCCTGGAGCACCCCCCTAG | 60 |
| Query | 61 | CAGGGCGTGGGGGATTTCCTGCGCTGCGTGCAGAAGGGTGGAGCCAACCACCTTAGTAT | 120 |
| | | | |
| Sbjct | 61 | CAGGGCGTGGGGGATTTCCTGCGCTGCGTGCAGAAGGGTGGAGCCAACCACCTTAGTAT | 120 |
| Query | 121 | GTAGGCGGCGGGACTCATGACGCTCGCGTGATGACAAGCGCCAAGCTTGACTTGGATGGC | 180 |
| | | | |

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|-------|------|--|------|
| Sbjct | 121 | GTAGGCGGCGGGACTCATGACGCTCGCGTGATGACAAGCGCCAAGCTTGACTTGGATGGC | 180 |
| Query | 181 | CCTGATGGGCGTTTCATGGGTTTCGGTGGTGGTGGCGCTTTAGGCAGCCTCCACGCCCACCA | 240 |
| | | | |
| Sbjct | 181 | CCTGATGGGCGTTTCATGGGTTTCGGTGGTGGTGGCGCTTTAGGCAGCCTCCACGCCCACCA | 240 |
| Query | 241 | CCTCCCAGATAGAGCGGCGGCACTGTAGGGAAGACCGGGGACCGGTCACTACCAAGGACG | 300 |
| | | | |
| Sbjct | 241 | CCTCCCAGATAGAGCGGCGGCACTGTAGGGAAGACCGGGGACCGGTCACTACCAAGGACG | 300 |
| Query | 301 | CAGACCTCTTTTTGAGTATCACGCCTCCGGAAGTAGTTGGGCAAGCCCACCTATATGTGT | 360 |
| | | | |
| Sbjct | 301 | CAGACCTCTTTTTGAGTATCACGCCTCCGGAAGTAGTTGGGCAAGCCCACCTATATGTGT | 360 |
| Query | 361 | TGGGATGGTTGGGGTTAGCCATCCATACCGTACTGCCTGATAGGGTCCTTGCGAGGGGAT | 420 |
| | | | |
| Sbjct | 361 | TGGGATGGTTGGGGTTAGCCATCCATACCGTACTGCCTGATAGGGTCCTTGCGAGGGGAT | 420 |
| Query | 421 | CTGGGAGTCTCGTAGACCGTAGCACATGCCTGTTATTTCTACTCAAACAAGTCCTGTACC | 480 |
| | | | |
| Sbjct | 421 | CTGGGAGTCTCGTAGACCGTAGCACATGCCTGTTATTTCTACTCAAACAAGTCCTGTACC | 480 |
| Query | 481 | TGCGCCCGAAGCGCAAGAACAAGCAGACGCAGGCTTCATATCCTGTGTCCATTAAAAC | 540 |
| | | | |
| Sbjct | 481 | TGCGCCCGAAGCGCAAGAACAAGCAGACGCAGGCTTCATATCCTGTGTCCATTAAAAC | 540 |
| Query | 541 | ATCTGTTGAAAGGGGACAACGAGCAAAGCGCAAAGTCCAGCGCGATGCTCGGCCTCGTAA | 600 |
| | | | |
| Sbjct | 541 | ATCTGTTGAAAGGGGACAACGAGCAAAGCGCAAAGTCCAGCGCGATGCTCGGCCTCGTAA | 600 |
| Query | 601 | TTACAAAATTGCTGGTATCCATGATGGCTTGCAGACATTGGCTCAGGCTGCTTTGCCAGC | 660 |
| | | | |
| Sbjct | 601 | TTACAAAATTGCTGGTATCCATGATGGCTTGCAGACATTGGCTCAGGCTGCTTTGCCAGC | 660 |
| Query | 661 | TCATGGTTGGGGACGCCAAGACCCTCGCCATAAGTCTCGCAATCTTGAATCCTTCTGGA | 720 |
| | | | |
| Sbjct | 661 | TCATGGTTGGGGACGCCAAGACCCTCGCCATAAGTCTCGCAATCTTGAATCCTTCTGGA | 720 |
| Query | 721 | TTACCCTTTGGGGTGGATTGGTGATGTTACAACCTCACACACCTCTAGTAGGCCCGCTGGT | 780 |
| | | | |
| Sbjct | 721 | TTACCCTTTGGGGTGGATTGGTGATGTTACAACCTCACACACCTCTAGTAGGCCCGCTGGT | 780 |
| Query | 781 | GGCAGGAGCGGTCGTTTCGACCAGTCTGCCAGATAGTACGCTTGCTGGAGGATGGAGTCAA | 840 |
| | | | |
| Sbjct | 781 | GGCAGGAGCGGTCGTTTCGACCAGTCTGCCAGATAGTACGCTTGCTGGAGGATGGAGTCAA | 840 |
| Query | 841 | CTGGGCTACTGGTTGGTTCGGTGTCCACCTTTTTGTGGTATGTCTGCTATCTTTGGCCTG | 900 |
| | | | |
| Sbjct | 841 | CTGGGCTACTGGTTGGTTCGGTGTCCACCTTTTTGTGGTATGTCTGCTATCTTTGGCCTG | 900 |
| Query | 901 | TCCCTGTAGTGGGGCGCGGGTCACTGACCCAGACACAAATACCACAATCCTGACCAATTG | 960 |
| | | | |
| Sbjct | 901 | TCCCTGTAGTGGGGCGCGGGTCACTGACCCAGACACAAATACCACAATCCTGACCAATTG | 960 |
| Query | 961 | CTGCCAGCGTAATCAGGTTATCTATTGTTCTCCTTCCACTTGCCCTACACGAGCCTGGTTG | 1020 |
| | | | |
| Sbjct | 961 | CTGCCAGCGTAATCAGGTTATCTATTGTTCTCCTTCCACTTGCCCTACACGAGCCTGGTTG | 1020 |
| Query | 1021 | TGTGATCTGTGCGGACGAGTGCTGGGTTCGCGCCAATCCGTACATCTCACACCCTTCCAA | 1080 |
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|-------|------|---|------|
| Sbjct | 1021 | TGTGATCTGCGCGGACGAGTGCTGGGTTCCTCGCCAATCCGTACATCTCACACCCTTCCAA | 1080 |
| Query | 1081 | TTGGACTGGCACGGACTCCTTCTTGGCTGACCACATTGATTTTGTATGGGCGCTCTTGT | 1140 |
| | | | |
| Sbjct | 1081 | TTGGACTGGCACGGACTCCTTCTTGGCTGACCACATTGATTTTGTATGGGCGCTCTTGT | 1140 |
| Query | 1141 | GACCTGTGACGCCCTTGACATTGGTGAGTTGTGTGGTGCGTGTGTATTAGTCGGTGACTG | 1200 |
| | | | |
| Sbjct | 1141 | GACCTGTGACGCCCTTGACATTGGTGAGTTGTGTGGTGCGTGTGTATTAGTCGGTGACTG | 1200 |
| Query | 1201 | GCTTGTGAGGCACTGGCTTATTACATAGACCTCAATGAACTGGTACTTGTTACCTGGA | 1260 |
| | | | |
| Sbjct | 1201 | GCTTGTGAGGCACTGGCTTATTACATAGACCTCAATGAACTGGTACTTGTTACCTGGA | 1260 |
| Query | 1261 | AGTGCCCACTGGAATAGATCCTGGGTTTCTAGGGTTTATCGGGTGGATGGCCGGCAAGGT | 1320 |
| | | | |
| Sbjct | 1261 | AGTGCCCACTGGAATAGATCCTGGGTTTCTAGGGTTTATCGGGTGGATGGCCGGCAAGGT | 1320 |
| Query | 1321 | CGAGGCTGTCATCTTCTTGACCAAAGTGGCTTCACAAGTACCATACGCTATTGCGACTAT | 1380 |
| | | | |
| Sbjct | 1321 | CGAGGCTGTCATCTTCTTGACCAAAGTGGCTTCACAAGTACCATACGCTATTGCGACTAT | 1380 |
| Query | 1381 | GTTTAGCAGTGTACACTACCTGGCGGTTGGCGCTCTGATCTACTATGCCTCTCGGGGCAA | 1440 |
| | | | |
| Sbjct | 1381 | GTTTAGCAGTGTACACTACCTGGCGGTTGGCGCTCTGATCTACTATGCCTCTCGGGGCAA | 1440 |
| Query | 1441 | GTGGTATCAGTTGCTCCTAGCGCTTATGCTTTACATAGAAGCGACCTCTGGAAACCCCAT | 1500 |
| | | | |
| Sbjct | 1441 | GTGGTATCAGTTGCTCCTAGCGCTTATGCTTTACATAGAAGCGACCTCTGGAAACCCCAT | 1500 |
| Query | 1501 | CAGGGTGCCCACTGGATGCTCAATAGCTGAGTTTTGCTCGCCTTTGATGATACCATGTCC | 1560 |
| | | | |
| Sbjct | 1501 | CAGGGTGCCCACTGGATGCTCAATAGCTGAGTTTTGCTCGCCTTTGATGATACCATGTCC | 1560 |
| Query | 1561 | TTGCCACTCTTATTTGAGTGAGAATGTGTCAGAAGTCATTTGTTACAGTCCAAAGTGGAC | 1620 |
| | | | |
| Sbjct | 1561 | TTGCCACTCTTATTTGAGTGAGAATGTGTCAGAAGTCATTTGTTACAGTCCAAAGTGGAC | 1620 |
| Query | 1621 | CAGGCCTATCACTCTAGAGTATAACAACCTCCATATCTTGGTACCCCTATACAATCCCTGG | 1680 |
| | | | |
| Sbjct | 1621 | CAGGCCTATCACTCTAGAGTATAACAACCTCCATATCTTGGTACCCCTATACAATCCCTGG | 1680 |
| Query | 1681 | TGCGAGGGGATGTATGGTTAAATTCAAAAATAACACATGGGGTTGCTGCCGTATTGCGAA | 1740 |
| | | | |
| Sbjct | 1681 | TGCGAGGGGATGTATGGTTAAATTCAAAAATAACACATGGGGTTGCTGCCGTATTGCGAA | 1740 |
| Query | 1741 | TGTGCCATCGTACTGCACTATGGGCACTGATGCAGTGTGGAACGACACTCGCAACACTTA | 1800 |
| | | | |
| Sbjct | 1741 | TGTGCCATCGTACTGCACTATGGGCACTGATGCAGTGTGGAACGACACTCGCAACACTTA | 1800 |
| Query | 1801 | CGAAGCATGCGGTGTAACACCATGGCTAACAACCGCATGGCACAACGGCTCAGCCCTGAA | 1860 |
| | | | |
| Sbjct | 1801 | CGAAGCATGCGGTGTAACACCATGGCTAACAACCGCATGGCACAACGGCTCAGCCCTGAA | 1860 |
| Query | 1861 | ATTGGCTATATTACAATACCCTGGGTCTAAAGAAATGTTTAAACCTCATAATTGGATGTC | 1920 |
| | | | |
| Sbjct | 1861 | ATTGGCTATATTACAATACCCTGGGTCTAAAGAAATGTTTAAACCTCATAATTGGATGTC | 1920 |
| Query | 1921 | AGGCCATTTGTATTTTGAGGGATCAGATACCCCTATAGTTTACTTTTATGACCCTGTGAA | 1980 |
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|-------|------|---|------|
| Sbjct | 1921 | AGGCCATTTGTATTTTGGAGGGATCAGATACCCCTATAGTTTACTTTTATGACCCTGTGAA | 1980 |
| Query | 1981 | TTCCACTCTCCTACCACCGGAGAGGTGGGCTAGGTTGCCCAGTACCCACCTGTGGTACG | 2040 |
| | | | |
| Sbjct | 1981 | TTCCACTCTCCTACCACCGGAGAGGTGGGCTAGGTTGCCCAGTACCCACCTGTGGTACG | 2040 |
| Query | 2041 | TGGTTCTTGGTTACAGGTTCCGCAAGGGTTTTACAGTGATGTGAAAGACCTAGCCACAGG | 2100 |
| | | | |
| Sbjct | 2041 | TGGTTCTTGGTTACAGGTTCCGCAAGGGTTTTACAGTGATGTGAAAGACCTAGCCACAGG | 2100 |
| Query | 2101 | ATTGATCACCAAAGACAAAGCCTGGAAAAATTATCAGGTCTTATATTCCGCCACGGGTGC | 2160 |
| | | | |
| Sbjct | 2101 | ATTGATCACCAAAGACAAAGCCTGGAAAAATTATCAGGTCTTATATTCCGCCACGGGTGC | 2160 |
| Query | 2161 | TTTGTCTCTTACGGGAGTTACCACCAAGGCCGTGGTGCTAATTCTGTTGGGGTTGTGTGG | 2220 |
| | | | |
| Sbjct | 2161 | TTTGTCTCTTACGGGAGTTACCACCAAGGCCGTGGTGCTAATTCTGTTGGGGTTGTGTGG | 2220 |
| Query | 2221 | CAGCAAGTATCTTATTTTAGCCTACCTCTGTTACTTGTCCCTTTGTTTTGGGCGCGCTTC | 2280 |
| | | | |
| Sbjct | 2221 | CAGCAAGTATCTTATTTTAGCCTACCTCTGTTACTTGTCCCTTTGTTTTGGGCGCGCTTC | 2280 |
| Query | 2281 | TGGTTACCCTTTGCGTCCGTGTGCTCCCATCCCAGTCGTATCTCCAAGCTGGCTGGGATGT | 2340 |
| | | | |
| Sbjct | 2281 | TGGTTACCCTTTGCGTCCGTGTGCTCCCATCCCAGTCGTATCTCCAAGCTGGCTGGGATGT | 2340 |
| Query | 2341 | TTTGTCTAAAGCTCAAGTAGCTCCTTTTGCTTTGATTTTCTTCATCTGTTGCTATCTCCG | 2400 |
| | | | |
| Sbjct | 2341 | TTTGTCTAAAGCTCAAGTAGCTCCTTTTGCTTTGATTTTCTTCATCTGTTGCT | 2400 |
| Query | 2401 | CTGCAGGCTACGTTATGCTGCCCTTTTAGGGTTTGTGCCCATGGCTGCGGG | 2460 |
| | | | |
| Sbjct | 2401 | CTGCAGGCTACGTTATGCTGCCCTTTTAGGGTTTGTGCCCATGGCTGCGGGCTTGC | 2460 |
| Query | 2461 | AACTTTCTTTGTTGCAGCAGCTGCTGCCCAACCAGATTATGACTGGTGGGTCGACTGCT | 2520 |
| | | | |
| Sbjct | 2461 | AACTTTCTTTGTTGCAGCAGCTGCTGCCCAACCAGATTATGACTGGTGGTGGCGACTGCT | 2520 |
| Query | 2521 | AGTGGCAGGGTTAGTTTTGTGGGCCGGCCGTAACCGTGGTCACCGCATAGCTCTGCTTGT | 2580 |
| | | | |
| Sbjct | 2521 | AGTGGCAGGGTTAGTTTTGTGGGCCGGCCGTGACCGTGGTCCACGTATAGCTCTGCTTGT | 2580 |
| Query | 2581 | AGGTCCTTGGCCTCTGGTAGCGCTTTTAACCCTCTTGCAATTTGGTTACGCCTGCTTCAGC | 2640 |
| | | | |
| Sbjct | 2581 | AGGTCCTTGGCCTCTGGTAGCGCTTTTAACCCTCTTGCAATTTGGCTACGCCTGCTTCAGC | 2640 |
| Query | 2641 | TTTTGATACCGAGATAATTGGAGGGCTGACAATACCACCTGTAGTAGCATTAGTTGTCAT | 2700 |
| | | | |
| Sbjct | 2641 | TTTTGACACCGAGATAATTGGAGGGCTGACAATACCACCTGTAGTAGCATTAGTTGTCAT | 2700 |
| Query | 2701 | GTCTCGTTTTGGCTTCTTTGCTCACTTGTTACCTCGCTGTGCTTTAGTTAACTCCTATCT | 2760 |
| | | | |
| Sbjct | 2701 | GTCTCGTTTTGGCTTCTTTGCTCACTTGTTACCTCGCTGTGCTTTAGTTAACTCCTATCT | 2760 |
| Query | 2761 | TTGGCAACGTTGGGAGAATTGGTTTTGGAACGTTACACTAAGACCGGAGAGGTTTTCTCT | 2820 |
| | | | |
| Sbjct | 2761 | TTGGCAACGTTGGGAGAATTGGTTTTGGAACGTTACACTAAGACCGGAGAGGTTTTCTCT | 2820 |
| Query | 2821 | TGTGCTGGTTTTGTTTTCCCGGTGCGACATATGACGCGCTGGTGACTTTCTGTGTGTGTCA | 2880 |
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NOTE

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|-------|------|---|------|
| Sbjct | 2821 | TGTGCTGGTTTGTTCCTCCCGGTGCGACATATGACACGCTGGTGACTTTCTGTGTGTGTCA | 2880 |
| Query | 2881 | CGTAGCTCTTCTATGTTTAAACATCCAGTGCAGCATCGTTCTTTGGGACTGACTCTAGGGT | 2940 |
| | | | |
| Sbjct | 2881 | CGTAGCTCTTCTATGTTTAAACATCCAGTGCAGCATCGTTCTTTGGGACTGACTCTAGGGT | 2940 |
| Query | 2941 | TAGGGCCCATAGAATGTTGGTGCGTCTCGGAAAGTGTCATGCTTGGTATTCTCATTATGT | 3000 |
| | | | |
| Sbjct | 2941 | TAGGGCCCATAGAATGTTGGTGCGTCTCGGAAAGTGTCATGCTTGGTATTCTCATTATGT | 3000 |
| Query | 3001 | TCTTAAGTTTTTCTCTTAGTGTTTGGTGAGAATGGTGTGTTTTTCTATAAGCACTTGCA | 3060 |
| | | | |
| Sbjct | 3001 | TCTTAAGTTTTTCTCTTAGTGTTTGGTGAGAATGGTGTGTTTTTCTATAAGCACTTGCA | 3060 |
| Query | 3061 | TGGTGATGTCTTGCCTAATGATTTTGCCTCGAAACTACCATTGCAAGAGCCATTTTTCCC | 3120 |
| | | | |
| Sbjct | 3061 | TGGTGATGTCTTGCCTAATGATTTTGCCTCGAAACTACCATTGCAAGAGCCATTTTTCCC | 3120 |
| Query | 3121 | TTTTGAAGGCAAGGCAAGGGTCTATAGGAATGAAGGAAGACGCTTGGCGTGTGGGGACAC | 3180 |
| | | | |
| Sbjct | 3121 | TTTTGAAGGCAAGGCAAGGGTCTATAGGAATGAAGGAAGACGCTTGGCGTGTGGGGACAC | 3180 |
| Query | 3181 | GGTTGATGGTTTGCCCGTTGTTGCGCGTCTCGGCGACCTTGTTTTCGCAGGGTTGGCTAT | 3240 |
| | | | |
| Sbjct | 3181 | GGTTGATGGTTTGCCCGTTGTTGCGCGTCTCGGCGACCTTGTTTTCGCAGGGTTAGCTAT | 3240 |
| Query | 3241 | GCCGCCAGATGGGTGGGCCATTACCGCACCTTTTACGCTGCAGTGTCTCTCTGAACGTGG | 3300 |
| | | | |
| Sbjct | 3241 | GCCGCCAGATGGGTGGGCCATTACCGCACCTTTTACGCTGCAGTGTCTCTCTGAACGTGG | 3300 |
| Query | 3301 | CACGCTGTCAGCGATGGCAGTGGTCATGACTGGTATAGACCCCGAACTTGGACTGGAAC | 3360 |
| | | | |
| Sbjct | 3301 | CACGCTGTCAGCGATGGCAGTGGTCATGACTGGTATAGACCCCGAACTTGGACTGGAAC | 3360 |
| Query | 3361 | TATCTTCAGATTAGGATCTCTGGCCACTAGCTACATGGGATTGTTTGTGACAACGTGTT | 3420 |
| | | | |
| Sbjct | 3361 | TATCTTCAGATTAGGATCTCTGGCCACTAGCTACATGGGATTGTTTGTGACAACGTGTT | 3420 |
| Query | 3421 | GTATACTGCTCACCATGGCAGCAAGGGGCGCCGGTTGGCTCATCCACAGGCTCTATACA | 3480 |
| | | | |
| Sbjct | 3421 | GTATACTGCTCACCATGGCAGCAAGGGGCGCCGGTTGGCTCATCCACAGGCTCCATACA | 3480 |
| Query | 3481 | CCCAATAACCGTTGACGCGGCTAATGACCAGGACATCTATCAACCACCATGTGGAGCTGG | 3540 |
| | | | |
| Sbjct | 3481 | CCCAATAACCGTTGACGCGGCTAATGACCAGGACATCTATCAACCACCATGTGGAGCTGG | 3540 |
| Query | 3541 | GTCCCTTACTCGGTGCTCTTGCGGGGAGACCAAGGGGTATCTGGTAACACGACTGGGGTC | 3600 |
| | | | |
| Sbjct | 3541 | GTCCCTTACTCGGTGCTCTTGCGGGGAGACCAAGGGGTATCTGGTAACACGACTGGGGTC | 3600 |
| Query | 3601 | ATTGGTTGAGGTCAACAAATCCGATGACCCCTATTGGTGTGTGTGCGGGGCCCTTCCCAT | 3660 |
| | | | |
| Sbjct | 3601 | ATTGGTTGAGGTCAACAAATCCGATGACCCCTATTGGTGTGTGTGCGGGGCCCTTCCCAT | 3660 |
| Query | 3661 | GGCTGTTGCCAAGGGTTCTTCAGGTGCCCCGATTCTGTGCTCCTCCGGGCATGTTATTGG | 3720 |
| | | | |
| Sbjct | 3661 | GGCTGTTGCCAAGGGTTCTTCAGGTGCCCCGATTCTGTGCTCCTCCGGGCATGTTATTGG | 3720 |
| Query | 3721 | GATGTTACCGCTGCTAGAAATTCTGGCGGTTCAGTCAGTCAGATTAGGGTTAGGCCGTT | 3780 |
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| Sbjct | 3721 | GATGTTACCGCTGCTAGAAATTCTGGCGGTTTCAGTCAGCCAGATTAGGGTTAGGCCGTT | 3780 |
| Query | 3781 | GGTGTGTGCTGGATACCATCCCCAGTACACAGCACATGCCACTCTTGATACAAAACCTAC | 3840 |
| | | | |
| Sbjct | 3781 | GGTGTGTGCTGGATACCATCCCCAGTACACAGCACATGCCACTCTTGATACAAAACCTAC | 3840 |
| Query | 3841 | TGTGCCTAACGAGTATTCAGTGCAAATTTTAATTGCCCCACTGGCAGCGGCAAGTCAAC | 3900 |
| | | | |
| Sbjct | 3841 | TGTGCCTAACGAGTATTCAGTGCAAATTTTAATTGCCCCACTGGCAGCGGCAAGTCAAC | 3900 |
| Query | 3901 | CAAATTACCACTTTCTTACATGCAGGAGAAGTATGAGGTCTTGGTCCTAAATCCCAGTGT | 3960 |
| | | | |
| Sbjct | 3901 | CAAATTACCACTTTCTTACATGCAGGAGAAGTATGAGGTCTTGGTCCTAAATCCCAGTGT | 3960 |
| Query | 3961 | GGCTACAACAGCATCAATGCCAAAGTACATGCACGCGACGTACGGCGTGAATCCAAATTG | 4020 |
| | | | |
| Sbjct | 3961 | GGCTACAACAGCATCAATGCCAAAGTACATGCACGCGACGTACGGCGTGAATCCAAATTG | 4020 |
| Query | 4021 | CTATTTTAATGGCAAATGTACCAACACAGGGGCTTCACTTACGTACAGCACATATGGCAT | 4080 |
| | | | |
| Sbjct | 4021 | CTATTTTAATGGCAAATGTACCAACACAGGGGCTTCACTTACGTACAGCACATATGGCAT | 4080 |
| Query | 4081 | GTACCTGACCGGAGCATGTTCCCGGAACATGATGTAATCATTGTGTGACGAATGCCATGC | 4140 |
| | | | |
| Sbjct | 4081 | GTACCTGACCGGAGCATGTTCCCGGAACATGACGTCATCATTGTGTGACGAATGCCATGC | 4140 |
| Query | 4141 | TACCGATGCAACCACCGTGTTGGGCATTGGAAAGGTCTAACC GAAGCTCCATCCAAAAA | 4200 |
| | | | |
| Sbjct | 4141 | TACCGATGCAACCACCGTGTTGGGCATTGGAAAGGTCTAACC GAAGCTCCATCCAAAAA | 4200 |
| Query | 4201 | TGTTAGGCTAGTGGTTCCTTGCCACGGCTACCCCCCTGGAGTAATCCCTACACCACATGC | 4260 |
| | | | |
| Sbjct | 4201 | TGTTAGGCTAGTGGTTCCTTGCCACGGCTACCCCCCTGGAGTAATCCCTACACCACATGC | 4260 |
| Query | 4261 | CAACATAACTGAGATTCAATTAACCGATGAAGGCACTATCCCCTTTCATGGAAAAAAGAT | 4320 |
| | | | |
| Sbjct | 4261 | CAACATAACTGAGATTCAATTAACCGATGAAGGCACTATCCCCTTTCATGGAAAAAAGAT | 4320 |
| Query | 4321 | TAAGGAGGAAAATCTGAAGAAAGGGAGACACCTTATCTTTGAGGCTACCAAAAAACACTG | 4380 |
| | | | |
| Sbjct | 4321 | TAAGGAGGAAAATCTGAAGAAAGGGAGACACCTTATCTTTGAGGCTACCAAAAAACACTG | 4380 |
| Query | 4381 | TGATGAGCTTGCTAACGAGTTAGCTCGAAAGGGAATAACAGCTGTCTCTTACTATAGGGG | 4440 |
| | | | |
| Sbjct | 4381 | TGATGAGCTTGCTAACGAGTTAGCTCGAAAGGGAATAACAGCTGTCTCTTACTATAGGGG | 4440 |
| Query | 4441 | ATGTGACATCTCAAAAATCCCTGAGGGCGACTGTGTAGTAGTTGCCACTGATGCCTTGTG | 4500 |
| | | | |
| Sbjct | 4441 | ATGTGACATCTCAAAAATCCCTGAGGGCGACTGTGTAGTAGTTGCCACTGATGCCTTGTG | 4500 |
| Query | 4501 | TACAGGGTACACTGGTGACTTTGATTCCGTGTATGACTGCAGCCTCATGGTAGAAGGCAC | 4560 |
| | | | |
| Sbjct | 4501 | TACAGGGTACACTGGTGACTTTGATTCCGTGTATGACTGCAGCCTCATGGTAGAAGGCAC | 4560 |
| Query | 4561 | ATGCCATGTTGACCTTGACCCTACTTTACCATGGGTGTTTCGTGTGTGCGGGGTTTCAGC | 4620 |
| | | | |
| Sbjct | 4561 | ATGCCATGTTGACCTTGACCCTACTTTACCATGGGTGTTTCGTGTGTGCGGGGTTTCAGC | 4620 |
| Query | 4621 | AATAGTTAAAGGCCAGCGTAGGGGCCGCACAGGCCGTGGGAGAGCTGGCATATACTACTA | 4680 |
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| Sbjct | 4621 | AATAGTTAAAGGCCAGCGTAGGGGCCGCACAGGCCGTGGGAGAGCTGGCATATACTACTA | 4680 |
| Query | 4681 | TGTAGACGGGAGTTGTACCCCTTCGGGTATGGTTCCTGAATGCAACATTGTTGAAGCCTT | 4740 |
| | | | |
| Sbjct | 4681 | TGTAGACGGGAGTTGTACCCCTTCGGGTATGGTTCCTGAATGCAACATTGTTGAAGCCTT | 4740 |
| Query | 4741 | CGACGCAGCCAAGGCATGGTATGGTTTGTTCATCAACAGAAGCTCAAACATTCTGGACAC | 4800 |
| | | | |
| Sbjct | 4741 | CGACGCAGCCAAGGCATGGTATGGTTTGTTCATCAACAGAAGCTCAAACATTCTGGACAC | 4800 |
| Query | 4801 | CTATCGCACCCAACCTGGGTTACCTGCGATAGGAGCAAATTTGGACGAGTGGGCTGATCT | 4860 |
| | | | |
| Sbjct | 4801 | CTATCGCACCCAACCTGGGTTACCTGCGATAGGAGCAAATTTGGACGAGTGGGCTGATCT | 4860 |
| Query | 4861 | CTTTTCTATGGTCAACCCCGAACCTTCATTTGTCAATACTGCAAAAAGAACTGCTGACAA | 4920 |
| | | | |
| Sbjct | 4861 | CTTTTCTATGGTCAACCCCGAACCTTCATTTGTCAATACTGCAAAAAGAACTGCTGACAA | 4920 |
| Query | 4921 | TTATGTTTTGTTGACTGCAGCCCAACTACAACGTGTGCATCAGTATGGCTATGCTGCTCC | 4980 |
| | | | |
| Sbjct | 4921 | TTATGTTTTGTTGACTGCAGCCCAACTACAACGTGTGCATCAGTATGGCTATGCTGCTCC | 4980 |
| Query | 4981 | CAATGACGCACCACGGTGGCAGGGAGCCCGCTTGGGAAAAAACCTTGTGGGGTTCTGTG | 5040 |
| | | | |
| Sbjct | 4981 | CAATGACGCACCACGGTGGCAGGGAGCCCGCTTGGGAAAAAACCTTGTGGGGTTCTGTG | 5040 |
| Query | 5041 | GCGCTTGGACGGCGCTGACGCCTGTCCTGGCCAGAGCCCAGCGAGGTGACCAGATACCA | 5100 |
| | | | |
| Sbjct | 5041 | GCGCTTGGACGGCGCTGACGCCTGTCCTGGCCAGAGCCCAGCGAGGTGACCAGATACCA | 5100 |
| Query | 5101 | AATGTGCTTCACTGAAGTCAATACTTCTGGGACAGCCGCACTCGCTGTTGGCGTTGGAGT | 5160 |
| | | | |
| Sbjct | 5101 | AATGTGCTTCACTGAAGTCAATACTTCTGGGACAGCCGCACTCGCTGTTGGCGTTGGAGT | 5160 |
| Query | 5161 | GGCTATGGCTTATCTAGCCATTGACACTTTTGGCGCCACTTGTGTGCGGCGTTGCTGGTC | 5220 |
| | | | |
| Sbjct | 5161 | GGCTATGGCTTATCTAGCCATTGACACTTTTGGCGCCACTTGTGTGCGGCGTTGCTGGTC | 5220 |
| Query | 5221 | TATTACATCAGTCCCTACCGGTGCTACTGTCGCCCCAGTGTTGACGAAGAAGAAATCGT | 5280 |
| | | | |
| Sbjct | 5221 | TATTACATCAGTCCCTACCGGTGCTACTGTCGCCCCAGTGTTGACGAAGAAGAAATCGT | 5280 |
| Query | 5281 | GGAGGAGTGTGCATCATTCATTCCCTTGGAGGCCATGGTTGCTGCAATTGACAAGCTGAA | 5340 |
| | | | |
| Sbjct | 5281 | GGAGGAGTGTGCATCATTCATTCCCTTGGAGGCCATGGTTGCTGCAATCGATAAGCTGAA | 5340 |
| Query | 5341 | GAGTACAATCACCACAACCTAGTCCTTTTACATTGGAAACCGCCCTTGAAAACTTAACAC | 5400 |
| | | | |
| Sbjct | 5341 | GAGTACAATAACCACAACCTAGTCCTTTTACATTGGAAACCGCCCTTGAAAACTTAACAC | 5400 |
| Query | 5401 | CTTTCTTGGGCCTCATGCAGCTACAATCCTTGCTATCATAGAGTATTGCTGTGGTTTAGT | 5460 |
| | | | |
| Sbjct | 5401 | CTTTCTTGGGCCTCATGCAGCTACAATCCTTGCTATCATAGAGTATTGCTGTGGCTTAGT | 5460 |
| Query | 5461 | CACTTTACCTGACAATCCCTTTGCATCATGCGTGTGCTTTTATTGCGGGTATTACTAC | 5520 |
| | | | |
| Sbjct | 5461 | CACTTTACCTGACAATCCCTTTGCATCATGCGTGTGCTTTTATTGCGGGTATTACTAC | 5520 |
| Query | 5521 | CCCACTACCTCACAAGATCAAAATGTTTCCTGTCATTATTTGGAGGCGCAATTGCGTCCAA | 5580 |
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|-------|------|--|------|
| Sbjct | 5521 | CCCACTACCTCACAAGATCAAATGTTCTGTATTATTTGGAGGCGCAATTGCGTCCAA | 5580 |
| Query | 5581 | GCTTACAGACGCTAGAGGCGCACTGGCGTTCATGATGGCCGGGGCTGCGGGAACAGCTCT | 5640 |
| | | | |
| Sbjct | 5581 | GCTTACAGACGCTAGAGGCGCACTGGCGTTCATGATGGCCGGGGCTGCGGGAACAGCTCT | 5640 |
| Query | 5641 | TGGTACATGGACATCGGTGGGTTTTGTCTTTGACATGCTAGGCGGCTATGCTGCCGCCTC | 5700 |
| | | | |
| Sbjct | 5641 | TGGTACATGGACATCGGTGGGTTTTGTCTTTGACATGCTAGGCGGCTATGCTGCCGCCTC | 5700 |
| Query | 5701 | ATCCACTGCTTGCTTGACATTTAAATGCTTGATGGGTGAGTGGCCCACTATGGATCAGCT | 5760 |
| | | | |
| Sbjct | 5701 | ATCCACTGCTTGCTTGACATTTAAATGCTTGATGGGTGAGTGGCCCACTATGGATCAGCT | 5760 |
| Query | 5761 | TGCTGGTTTAGTCTACTCCGCGTTCAATCCGGCCGCAGGAGTTGTGGGCGTCTTGTCAGC | 5820 |
| | | | |
| Sbjct | 5761 | TGCTGGTTTAGTCTACTCCGCGTTCAATCCGGCCGCAGGAGTTGTGGGCGTCTTGTCAGC | 5820 |
| Query | 5821 | TTGTGCAATGTTTGCTTTGACAACAGCAGGGCCAGATCACTGGCCCAACAGACTTCTTAC | 5880 |
| | | | |
| Sbjct | 5821 | TTGTGCAATGTTTGCTTTGACAACAGCAGGGCCAGATCACTGGCCCAACAGACTTCTTAC | 5880 |
| Query | 5881 | TATGCTTGCTAGGAGCAACACTGTATGTAATGAGTACTTTATTGCCACTCGTGACATCCG | 5940 |
| | | | |
| Sbjct | 5881 | TATGCTTGCTAGGAGCAACACTGTATGTAATGAGTACTTTATTGCCACTCGTGACATCCG | 5940 |
| Query | 5941 | CAGGAAGATACTGGGCATTCTGGAGGCATCTACCCCCTGGAGTGTTCATATCAGCTTGCA | 6000 |
| | | | |
| Sbjct | 5941 | CAGGAAGATACTGGGCATTCTGGAGGCATCTACCCCCTGGAGTGTTCATATCAGCTTGCA | 6000 |
| Query | 6001 | CCGTTGGCTCCACACCCCGACGGAGGATGATTGCGGCCTCATTGCTTGGGGTCTAGAGAT | 6060 |
| | | | |
| Sbjct | 6001 | CCGTTGGCTCCACACCCCGACGGAGGATGATTGCGGCCTCATTGCTTGGGGTCTAGAGAT | 6060 |
| Query | 6061 | TTGGCAGTATGTGTGCAATTTCTTTGTGATTTGCTTTAATGTCCTTAAAGCTGGAGTTCA | 6120 |
| | | | |
| Sbjct | 6061 | TTGGCAGTATGTGTGCAATTTCTTTGTGATTTGCTTTAATGTCCTTAAAGCTGGAGTTCA | 6120 |
| Query | 6121 | GAGCATGGTTAACATTCTGGTTGTCCTTTCTACAGCTGCCAGAAGGGGTACAAGGGCCC | 6180 |
| | | | |
| Sbjct | 6121 | GAGCATGGTTAACATTCTGGTTGTCCTTTCTACAGCTGCCAGAAGGGGTACAAGGGCCC | 6180 |
| Query | 6181 | CTGGATTGGATCAGGTATGCTCCAAGCACGCTGTCCATGCGGTGCTGAACTCATCTTTTC | 6240 |
| | | | |
| Sbjct | 6181 | CTGGATTGGATCAGGTATGCTCCAAGCACGCTGTCCATGCGGTGCTGAACTCATCTTTTC | 6240 |
| Query | 6241 | TGTTGAGAATGGTTTTTGCAAACTTTACAAAGGACCCAGAACTTGTTCAAATTACTGGAG | 6300 |
| | | | |
| Sbjct | 6241 | TGTTGAGAATGGTTTTTGCAAACTTTACAAAGGACCCAGAACTTGTTCAAATTACTGGAG | 6300 |
| Query | 6301 | AGGGGCTGTTCCAGTCAACGCTAGGCTGTGTGGGTGCGCTAGACCGGACCCAACTGATTG | 6360 |
| | | | |
| Sbjct | 6301 | AGGGGCTGTTCCAGTCAACGCTAGGCTGTGTGGGTGCGCTAGACCGGACCCAACTGATTG | 6360 |
| Query | 6361 | GACTAGTCTTGTCGTCAATTATGGCGTTAGGGACTACTGTAAATATGAGAAAATGGGAGA | 6420 |
| | | | |
| Sbjct | 6361 | GACTAGTCTTGTCGTCAATTATGGCGTTAGGGACTACTGTAAATATGAGAAAATGGGAGA | 6420 |
| Query | 6421 | TCACATTTTTGTTACAGCAGTATCCTCTCAAATGTCTGTTTCACCCAGGTGCCCCAAC | 6480 |
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|-------|------|--|------|
| Sbjct | 6421 | TCACATTTTTGTTACAGCAGTATCCTCTCCAAATGTCTGTTTCACCCAGGTGCCCCAAC | 6480 |
| Query | 6481 | CTTGAGAGCTGCAGTGGCCGTGGACGGCGTACAGGTTCAAGTGTATCTAGGTGAGCCCCAA | 6540 |
| | | | |
| Sbjct | 6481 | CTTGAGAGCTGCAGTGGCCGTGGACGGCGTACAGGTTCAAGTGTATCTAGGTGAGCCCCAA | 6540 |
| Query | 6541 | AACTCCTTGGACGACATCTGCTTGCTGTTACGGTCCTGACGGTAAGGGTAAAAGTGTAA | 6600 |
| | | | |
| Sbjct | 6541 | AACTCCTTGGACGACATCTGCTTGCTGTTACGGTCCGGACGGTAAGGGTAAAAGTGTAA | 6600 |
| Query | 6601 | GCTTCCCTTCCGCGTTGACGGTCACACACCTGGTGTGCGCATGCAACTTAATTTGCGTGA | 6660 |
| | | | |
| Sbjct | 6601 | GCTTCCCTTCCGCGTTGACGGTCACACACCTGGTGTGCGCATGCAACTTAATTTGCGTGA | 6660 |
| Query | 6661 | TGCACTTGAGACAAATGACTGTAATTCACAAACAACACTCCTAGTGATGAAGCCGCAGT | 6720 |
| | | | |
| Sbjct | 6661 | TGCACTTGAGACAAATGACTGTAATTCATAAACAACACTCCTAGTGATGAAGCCGCAGT | 6720 |
| Query | 6721 | GTCCGCTCTTGTTTTCAAACAGGAGTTGCGGCGTACAAACCAATTGCTTGAGGCAATTTTC | 6780 |
| | | | |
| Sbjct | 6721 | GTCCGCTCTTGTTTTCAAACAGGAGTTGCGGCGTACAAACCAATTGCTTGAGGCAATTTTC | 6780 |
| Query | 6781 | AGCTGGCGTTGACACCACCAAAGTCCAGCCCCCTCCATCGAAGAGGTAGTGGTAAGAAA | 6840 |
| | | | |
| Sbjct | 6781 | AGCTGGCGTTGACACCACCAAAGTCCAGCCCCCTCCATCGAAGAGGTAGTGGTAAGAAA | 6840 |
| Query | 6841 | GCGCCAGTTCCGGGCAAGAAGTGGTTCGCTTACCTTGCCCTCCCCCTCCGAGATCCGTCCC | 6900 |
| | | | |
| Sbjct | 6841 | GCGCCAGTTCCGGGCAAGAAGTGGTTCGCTTACCTTGCCCTCCCCCTCCGAGATCCGTCCC | 6900 |
| Query | 6901 | AGGAGTGTGTCATGTCCTGAAAGCCTGCAACGAAGTGACCCGTTAGAAGGTCCTTCAAACCT | 6960 |
| | | | |
| Sbjct | 6901 | AGGAGTGTGTCATGTCCTGAAAGCCTGCAACGAAGTGACCCGTTAGAAGGTCCTTCAAACCT | 6960 |
| Query | 6961 | CCCTCCTTCACCACCTGTTCTACAGTTGGCCATGCCGATGCCCTGTTGGGAGCGGGTGA | 7020 |
| | | | |
| Sbjct | 6961 | CCCTCCTTCACCACCTGTTCTACAGTTGGCCATGCCGATGCCCTGTTGGGAGCAGGTGA | 7020 |
| Query | 7021 | GTGTAACCCTTTCACTGCAATTGGATGTGCAATGACCGAAACAGGCGGAGGCCCTGATGA | 7080 |
| | | | |
| Sbjct | 7021 | GTGTAACCCTTTCACTGCAATTGGATGTGCAATGACCGAAACAGGCGGAGGCCCTGATGA | 7080 |
| Query | 7081 | TTTACCCAGTTACCCTCCCAAAAAGGAGGTCTCTGAATGGTCAGACGAAAGTTGGTCAAC | 7140 |
| | | | |
| Sbjct | 7081 | TTTACCCAGTTACCCTCCCAAAAAGGAGGTCTCTGAATGGTCAGACGGAAGTTGGTCAAC | 7140 |
| Query | 7141 | GGCTACAACCGCTTCCAGCTACGTTACTGGCCCCCGTACCCTAAGATACGGGGAAAGGA | 7200 |
| | | | |
| Sbjct | 7141 | GACTACAACCGCTTCCAGCTACGTTACTGGCCCCCGTACCCTAAGATACGGGGAAAGGA | 7200 |
| Query | 7201 | TTCCACTCAGTCAGCCCCCGCCAAACGGCCTACAAAAAAGAAGTTGGGAAAGAGTGAGTT | 7260 |
| | | | |
| Sbjct | 7201 | TTCCACTCAGTCAGCCCCCGCCAAACGGCCTACAAAAAAGAAGTTGGGAAAGAGTGAGTT | 7260 |
| Query | 7261 | TTCGTGCAGCATGAGCTACACCTGGACCGACGTGATTAGCTTCAAACTGCTTCTAAAGT | 7320 |
| | | | |
| Sbjct | 7261 | TTCGTGCAGCATGAGCTACACTTGGACCGACGTGATTAGCTTCAAACTGCTTCTAAAGT | 7320 |
| Query | 7321 | TCTGTCTGCAACTCGGGCCATCACTAGTGGTTTCCTCAAACAAAGATCATTGGTGTATGT | 7380 |
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| Sbjct | 7321 | TCTGTCTGCAACTCGGGCCATCACTAGTGGTTTCCTCAAACAAAGATCATTGGTGTATGT | 7380 |
| Query | 7381 | GACTGAGCCGCGGGATGCGGAGCTTAGAAAACAAAAGTCACTATTAATAGACAACCTCT | 7440 |
| | | | |
| Sbjct | 7381 | GACTGAGCCGCGGGATGCGGAGCTTAGAAAACAAAAGTCACTATTAATAGACAACCTCT | 7440 |
| Query | 7441 | GTTCCCCCATCATACCACAAGCAAGTGAGATTGGCTAAGGAAAAAGCTTCAAAAGTTGT | 7500 |
| | | | |
| Sbjct | 7441 | GTTCCCCCATCATACCACAAGCAAGTGAGATTGGCTAAGGAAAAAGCTTCAAAAGTTGT | 7500 |
| Query | 7501 | CGGTGTCATGTGGGACTATGATGAAGTAGCAGCTCACACGCCCTCTAAGTCTGCTAAGTC | 7560 |
| | | | |
| Sbjct | 7501 | CGGTGTCATGTGGGACTATGATGAAGTAGCAGCTCACACGCCCTCTAAGTCTGCTAAGTC | 7560 |
| Query | 7561 | CCACATCACTGGCCTTCGGGGCACTGATGTTTCGTTCTGGAGCAGCCCGCAAGGCTGTTCT | 7620 |
| | | | |
| Sbjct | 7561 | CCACATCACTGGCCTTCGGGGCACTGATGTTTCGTTCTGGAGCAGCCCGCAAGGCTGTTCT | 7620 |
| Query | 7621 | GGACTTGCAGAAGTGTGTCGAGGCAGGTGAGATACCGAGTCATTATCGGCAAACCTGTGAT | 7680 |
| | | | |
| Sbjct | 7621 | GGACTTGCAGAAGTGTGTCGAGGCAGGTGAGATACCGAGTCATTATCGGCAAACCTGTGAT | 7680 |
| Query | 7681 | AGTTCCAAAGGAGGAGGTCTTCGTGAAGACCCCCAGAAACCAACAAAGAAACCCCCAAG | 7740 |
| | | | |
| Sbjct | 7681 | AGTTCCAAAGGAGGAGGTCTTCGTGAAGACCCCCAGAAACCAACAAAGAAACCCCCAAG | 7740 |
| Query | 7741 | GCTTATCTCGTACCCCCACCTTGAAATGAGATGTGTTGAGAAGATGTACTACGGTCAGGT | 7800 |
| | | | |
| Sbjct | 7741 | GCTTATCTCGTACCCCCACCTTGAAATGAGATGTGTTGAGAAGATGTACTACGGTCAGGT | 7800 |
| Query | 7801 | TGCTCCTGACGTAGTTAAAGCTGTCATGGGAGATGCGTACGGGTTTGTAGATCCACGTAC | 7860 |
| | | | |
| Sbjct | 7801 | TGCTCCTGACGTAGTTAAAGCTGTCATGGGAGATGCGTACGGGTTTGTGACCCACGTAC | 7860 |
| Query | 7861 | CCGTGTCAAGCGTCTGTTGTCGATGTGGTCACCCGATGCAGTCGGAGCCACATGCGATAC | 7920 |
| | | | |
| Sbjct | 7861 | CCGTGTCAAGCGTCTGTTGTCGATGTGGTCACCCGATGCAGTCGGAGCCACATGCGATAC | 7920 |
| Query | 7921 | AGTGTGTTTTTGACAGTACCATCACACCCGAGGATATCATGGTGGAGACAGACATCTACTC | 7980 |
| | | | |
| Sbjct | 7921 | AGTGTGTTTTTGACAGTACCATCACACCCGAGGATATCATGGTGGAGACAGACATCTACTC | 7980 |
| Query | 7981 | AGCAGCTAAACTCAGTGACCAACACCGAGCTGGCATTACACCATTGCGAGGCAGTTATA | 8040 |
| | | | |
| Sbjct | 7981 | AGCAGCTAAACTCAGTGACCAACACCGAGCTGGCATTACACCATTGCGAGGCAGTTATA | 8040 |
| Query | 8041 | CGCTGGAGGACCGATGATCGCTTATGATGGCCGAGAGATCGGATATCGTAGGTGTAGGTC | 8100 |
| | | | |
| Sbjct | 8041 | CGCTGGAGGACCGATGATCGCTTATGATGGCCGAGAGATCGGATATCGTAGGTGTAGGTC | 8100 |
| Query | 8101 | TTCCGGCGTCTATACTACCTCAAGTTCCAACAGTTTGACCTGCTGGCTGAAGGTAAATGC | 8160 |
| | | | |
| Sbjct | 8101 | TTCCGGCGTCTATACTACCTCAAGTTCCAACAGTTTGACCTGCTGGCTGAAGGTAAATGC | 8160 |
| Query | 8161 | TGCAGCCGAACAGGCTGGCATGAAGAACCCTCGCTTCCTTATTTGCGGCGATGATTGCAC | 8220 |
| | | | |
| Sbjct | 8161 | TGCAGCCGAACAGGCTGGCATGAAGAACCCTCGCTTCCTTATTTGCGGCGATGATTGCAC | 8220 |
| Query | 8221 | CGTAATTTGGAAGAGCGCCGGAGCAGATGCAGACAAACAAGCAATGCGTGTCTTTGCTAG | 8280 |
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| Sbjct | 8221 | CGTAATTTGGAAGAGCGCCGGAGCAGATGCAGACAAACAAGCAATGCGTGTCTTTGCTAG | 8280 |
| Query | 8281 | CTGGATGAAGGTGATGGGTGCACCACAAGATTGTGTGCCTCAACCCAAATACAGTTTGA | 8340 |
| Sbjct | 8281 | CTGGATGAAGGTGATGGGTGCACCACAAGATTGTGTGCCTCAACCCAAATACAGTTTGA | 8340 |
| Query | 8341 | AGAATTAACATCATGCTCATCAAATGTTACCTCTGGAATTACCAAAAGTGGCAAGCCTTA | 8400 |
| Sbjct | 8341 | AGAATTAACATCATGCTCATCAAATGTTACCTCTGGAATTACCAAAAGTGGCAAGCCTTA | 8400 |
| Query | 8401 | CTACTTTCTTACAAGAGATCCTCGTATCCCCCTTGGCAGGTGCTCTGCCGAGGGTCTGGG | 8460 |
| Sbjct | 8401 | CTACTTTCTTACAAGAGATCCTCGTATCCCCCTTGGCAGGTGCTCTGCCGAGGGTCTGGG | 8460 |
| Query | 8461 | ATACAACCCCAGTGCTGCGTGGATTGGGTATCTAATACATCACTACCCATGTTTGTGGGT | 8520 |
| Sbjct | 8461 | ATACAACCCCAGTGCTGCGTGGATTGGGTATCTAATACATCACTACCCATGTTTGTGGGT | 8520 |
| Query | 8521 | TAGCCGTGTGTTGGCTGTCCATTTTCATGGAGCAGATGCTCTTTGAGGACAAACTTCCCGA | 8580 |
| Sbjct | 8521 | TAGCCGTGTGTTGGCTGTCCATTTTCATGGAGCAGATGCTCTTTGAGGACAAACTTCCCGA | 8580 |
| Query | 8581 | GACTGTGACCTTTGACTGGTATGGGAAAAATTATACGGTGCCTGTAGAAGATCTGCCCAG | 8640 |
| Sbjct | 8581 | GACTGTGACCTTTGACTGGTATGGGAAAAATTATACGGTGCCTGTAGAAGATCTGCCCAG | 8640 |
| Query | 8641 | CATCATTGCTGGTGTGCACGGTATTGAGGCTTTCTCGGTGGTGCCTACACCAACGCTGA | 8700 |
| Sbjct | 8641 | CATCATTGCTGGTGTGCACGGTATTGAGGCTTTCTCGGTGGTGCCTACACCAACGCTGA | 8700 |
| Query | 8701 | GATCCTCAGAGTTTCCCAATCACTAACAGACATGACCATGCCCCCCTGCGAGCCTGGCG | 8760 |
| Sbjct | 8701 | GATCCTCAGAGTTTCCCAATCACTAACAGACATGACCATGCCCCCCTGCGAGCCTGGCG | 8760 |
| Query | 8761 | AAAGAAAGCCAGGGCGGTCTCGCCAGCGCCAAGAGGCGTGGCGGAGCACACGCAAAATT | 8820 |
| Sbjct | 8761 | AAAGAAAGCCAGGGCGGTCTCGCCAGCGCCAAGAGGCGTGGCGGAGCACACGCAAAATT | 8820 |
| Query | 8821 | GGCTCGCTTCCTTCTCTGGCATGCTACATCTAGACCTCTACCAGATTGGATAAGACGAG | 8880 |
| Sbjct | 8821 | GGCTCGCTTCCTTCTCTGGCATGCTACATCTAGACCTCTACCAGATTGGATAAGACGAG | 8880 |
| Query | 8881 | CGTGGCTCGGTACACCACTTTCAATTATTGTGATGTTTACTCCCCGAGGGGGATGTGTT | 8940 |
| Sbjct | 8881 | CGTGGCTC' ACCACTTTCAATTATTGTGATGTTTACTCCCCGAGGGGGATGTGTT | 8940 |
| Query | 8941 | TATTAC. TATTGCAGAAGTTCCTTGTGAAGTATTTGGCTGTCATTGTTTT | 9000 |
| Sbjct | 8941 | TGTTACACCAC. TATTGCAGAAGTTCCTTGTGAAGTATTTGGCTGTCATTGTTTT | 9000 |
| Query | 9001 | TGCCCCAGGGGCTCATTGCTGTTGGATTAGCCATCAGCTGAACCCCCAAATTCAAATTAA | 9060 |
| Sbjct | 9001 | TGCCCCAGGGGCTCATTGCTGTTGGACTAGCCATCAGCTGAACCCCCAAATTCAAATTAA | 9060 |
| Query | 9061 | CTAACAG----TTTTTTTTTTTTTTTTTTTTTTTTTTAGGGCAGCGGCAACAGGGGAGACCCC | 9116 |
| Sbjct | 9061 | TTAACAGTTTTTTTTTTTTTTTTTTTTTTTTTTAGGGCAGCGGCAACAGGGGAGACCCC | 9120 |
| Query | 9117 | GGGCTTAACGACCCCGC 9133 | |

NOTE

Sbjct 9121 GGGCTTAACGACCCCGC 9137

CPU time: 0.03 user secs. 0.01 sys. secs 0.04 total secs.

| Lambda | K | H |
|--------|-------|------|
| 1.33 | 0.621 | 1.12 |

Gapped

| Lambda | K | H |
|--------|-------|------|
| 1.33 | 0.621 | 1.12 |

Matrix: blastn matrix:1 -2

Gap Penalties: Existence: 5, Extension: 2

Number of Sequences: 1

Number of Hits to DB: 4626

Number of extensions: 85

Number of successful extensions: 19

Number of sequences better than 10.0: 1

Number of HSP's gapped: 1

Number of HSP's successfully gapped: 1

Length of query: 9399

Length of database: 17,071,139,809

Length adjustment: 28

Effective length of query: 9371

Effective length of database: 17,071,139,781

Effective search space: 159973650887751

Effective search space used: 159973650887751

X1: 11 (21.1 bits)

X2: 26 (50.0 bits)

X3: 26 (50.0 bits)

S1: 16 (31.5 bits)

S2: 23 (44.9 bits)

EXHIBIT 2

Sequence Alignment

NIH vs. Traboni

| | | | |
|---------|-----|--|-----|
| NIH | 1 | AGTTTGGCGACCATGGTGGATCAGAACCGTTTCGGGTGAAGCCATGGTCTGAAGGGGATG | 60 |
| | | | |
| Traboni | 1 | AGTTTGGCGACCATGGTGGATCAGAACCGTTTCGGGTGAAGCCATGGTCTGAAGGGGATG | 60 |
| NIH | 61 | ACGTCCCTTCTGGCTCATCCACAAAAACCGTCTCGGGTGGGTGAGGAGTCCTGGCTGTGT | 120 |
| | | | |
| Traboni | 61 | ACGTCCCTTCTGGCTCATCCACAAAAACCGTCTCGGGTGGGTGAGGAGTCCTGGCTGTGT | 120 |
| NIH | 121 | GGGAAGCAGTCAGTATAATTCCCGTCGTGTGTGGTGACGCCTCACGACGTATTTGTCCGC | 180 |
| | | | |
| Traboni | 121 | GGGAAGCAGTCAGTATAATTCCCGTCGTGTGTGGTGACGCCTCACGACGTACTTGTCCGC | 180 |
| NIH | 181 | TGTGCAGAGCGTAGTACCAAGGGCTGCACCCCGGTTTTTGTTCGAAGCGGAGGGCAACCC | 240 |
| | | | |
| Traboni | 181 | TGTGCAGAGCGTAGTACCAAGGGCTGCACCCCGGTTTTTGTTCGAAGCGGAGGGCAACCC | 240 |
| NIH | 241 | CCGCTTGGAATTAAAAACT | 259 |
| | | | |
| Traboni | 241 | CCGCTTGGAATTAAAAACT | 259 |

NIH vs. Martin

| | | | |
|--------|-----|---|-----|
| NIH | 1 | AGTTTGGCGACCATGGTGGATCAGAACCGTTTCGGGTGAAGCCATGGTCTGAAGGGGATG | 60 |
| | | | |
| Martin | 1 | GAGTTTG-CGACCATGGTGGATCAGAACCGTTTCGGGTGAAGCCATGGTCTGAAGGGGATG | 60 |
| NIH | 61 | ACGTCCCTTCTGGCTCATCCACAAAAACCGTCTCGGGTGGGTGAGGAGTCCTGGCTGTGT | 120 |
| | | | |
| Martin | 61 | ACGTCCCTTCTGGCTCATCCACAAAAACCGTCTCGGGTGGGTGAGGAGTCCTGGCTGTGT | 120 |
| NIH | 121 | GGGAAGCAGTCAGTATAATTCCCGTCGTGTGTGGTGACGCCTCACGACGTATTTGTCCGC | 180 |
| | | | |
| Martin | 121 | GGGAAGCAGTCAGTATAATTCCCGTCGTGTGTGGTGACGCCTCACGACGTATTTGTCCGC | 180 |
| NIH | 181 | TGTGCAGAGCGTAGTACCAAGGGCTGCACCCCGGTTTTTGTTCGAAGCGGAGGGCAACCC | 240 |
| | | | |
| Martin | 181 | TGTGCAGAGCGTAGTACCAAGGGCTGCACCCCGGTTTTTGTTCGAAGCGGAGGGCAACCC | 240 |
| NIH | 241 | CCGCTTGGAATTAAAAACT | 259 |
| | | | |
| Martin | 241 | CCGCTTGGAATTAAAAACTG | 260 |